CLAIMS:

1. A method comprising:

a) combining at least one aromatic diol, at least one dicarboxylic acid, and at least one diaryl carbonate to provide a mixture;

b) heating the mixture in the presence of a catalyst selected from the group consisting of metal alkoxides, metal oxides and metal carboxylates; and

c) applying a vacuum to prepare a hydroxy-terminated arylate oligomer.

2. The method of claim 1 wherein the heating step comprises heating the mixture to a temperature ranging from about 230° to about 300° C.

3. The method of claim 1 wherein the heating step comprises heating the mixture for a period of time ranging from about 25 minutes to about 400 minutes.

4. The method of claim 1 wherein the applying the vacuum step further comprises reducing the pressure to an amount ranging from about 60 mbar to about 0.01 mbar.

5. The method of claim 1 wherein the applying the vacuum step further comprises cooling the mixture to a temperature ranging from about 190° to about 290° C.

6. The method of claim 1 wherein the applying the vacuum step occurs for a period of time ranging from about 60 minutes to about 240 minutes.

7. The method of claim 1 wherein the combining step comprises combining the at least one aromatic diol, the at least one dicarboxylic acid and the at least one diaryl carbonate at a molar ratio of from about 1.1:1.0:2.0 to about 2.0:1.0:2.50.

8. The method of claim 1 wherein the combining step comprises combining at least one aromatic diol selected from the group consisting of 2,2-bis(4-hydroxyphenyl)propane, 1,1-bis(4-hydroxyphenyl) cyclohexane, 1,1-bis(4-hydroxyphenyl)ethane, bis(4-hydroxyphenyl)methane, 1,2-bis(4-hydroxyphenyl)ethane, bis(4-hydroxyphenyl)phenylethane, bis(4-hydroxyphenyl)cyclohexylmethane, 3,3-bis(4-hydroxyphenyl) pentane, bis(4-hydroxyphenyl)sulfone, bis(4-hydroxyphenyl)ether, 1,3-dihydroxybenzene, and mixtures thereof.

9. The method of claim 1 wherein the combining step comprises selecting 1,3-dihydroxybenzene as the at least one aromatic diol.

10. The method of claim 1 wherein the combining step comprises combining at least one dicarboxylic acid selected from the group consisting of isophthalic acid, terephthalic acid, diphenyl dicarboxylic acids, diphenylether dicarboxylic acids, naphthalenedicarboxylic acids, naphthalene-2,6-dicarboxylic acid, and mixtures thereof.

11. The method of claim 1 wherein the combining step comprises combining a mixture of isophthalic and terephthalic acids as the at least one dicarboxylic acid.

12. The method of claim 1 wherein the combining step comprises combining at least one diaryl carbonate selected from the group consisting of diphenyl carbonate, ditolyl carbonate, bis-(2-chlorophenyl) carbonate, bis-(2-nitrophenyl) carbonate, bis-(2-carbonylmethoxy) carbonate, dinaphthyl carbonate, bis(diphenyl) carbonate, and mixtures thereof.

13. The method of claim 1 wherein the heating step comprises heating in the presence of a catalyst selected from the group consisting of titanium butoxide, titanium tetrabutoxide, titanium propoxide, titanium phenoxide, antimony trioxide, zirconium butoxide, dialkyltin dialkoxides, dibutyltin oxide, dibutyltin diesters, and tin phenoxide.

14. The method of claim 1 wherein the heating step comprises heating in the presence of a metal alkoxide catalyst wherein the metal is selected from the group consisting of Group IVB metals or derivatives of Group IVA metals.

15. The method of claim 14 wherein the heating step comprises heating in the presence of a metal alkoxide catalyst in an amount ranging from about 10 ppm to about 1000 ppm with respect to the final polymer.

16. The method of claim 13 wherein the heating step further comprises adding a co-catalyst selected from the group consisting of phosphate salts containing one, two, or three alkali metal groups; phosphite salts containing one or two alkali metal groups; hypophosphite salts containing any number of alkali metal groups; and polyphosphate salts containing one, two, three, four, or five alkali metal groups.

17. The method of claim 16 wherein the heating step comprises heating in the presence of sodium dihydrogen phosphate as the co-catalyst.

18. The method of claim 16 wherein the heating step comprises adding the co-catalyst at a molar ratio of co-catalyst to catalyst ranging from about 2:1 to about 10:1.

19. The method of claim 1 further comprising subjecting the mixture to an argon purge of about 0.1 to about 10.0 l/min.

20. The method of claim 1 wherein the heating step produces a hydroxy-terminated arylate oligomer having a Mw ranging from about 1000 to about 50000.

21. The method of claim 1 wherein the combining step comprises combining 1,3-dihydroxybenzene as the at least one aromatic diol, a mixture of isophthalic acid and terephthalic acid as the at least one dicarboxylic acid, and diphenyl carbonate as the at least one diaryl carbonate.

22. The method of claim 21 wherein the applying the vacuum step occurs for a period of time ranging from about 100 minutes to about 195 minutes.

23. The method of claim 22 wherein the heating step produces a hydroxy-terminated arylate oligomer having a Mw ranging from about 2000 to about 20,000.

24. The method of claim 22 wherein the heating step produces a hydroxy-terminated arylate oligomer having a Mw of from about 1,000 to about 10,000.

25. A method comprising:

a) combining at least one aromatic diol, at least one dicarboxylic acid, and at least one diaryl carbonate to provide a mixture;

b) heating the mixture in the presence of a catalyst selected from the group consisting of metal alkoxides, metal oxides and metal carboxylates; and

c) applying a vacuum to prepare a polyarylate.

26. The method of claim 25 wherein the heating step comprises heating the mixture to a temperature ranging from about 230° to about 300° C.

27. The method of claim 25 wherein the heating step comprises heating the mixture for a period of time ranging from about 25 minutes to about 400 minutes.

28. The method of claim 25 wherein the applying the vacuum step further comprises reducing the pressure to an amount ranging from about 60 mbar to about 0.01 mbar.

29. The method of claim 25 wherein the applying the vacuum step further comprises cooling the mixture to a temperature ranging from about 190° to about 290° C.

30. The method of claim 25 wherein the applying the vacuum step occurs for a period of time ranging from about 200 minutes to about 230 minutes.

31. The method of claim 30 wherein the heating step produces a polyarylate having a Mw ranging from about 30,000 to about 60,000.

32. A method comprising:

a) combining 1,3-dihydroxybenzene, a first mixture of isophthalic acid and terephthalic acid, and diphenyl carbonate to provide a second mixture;

b) heating the second mixture in the presence of a titanium tetrabutoxide catalyst and a sodium dihydrogen phosphate co-catalyst; and

c) applying a vacuum to obtain a hydroxy-terminated isophthalate/terephthalate/resorcinol arylate oligomer.

33. The method of claim 32 wherein the heating step comprises heating the second mixture to a temperature ranging from about 260° to about 290° C.

34. The method of claim 32 wherein the heating step comprises heating the second mixture for a period of time ranging from about 100 minutes to about 200 minutes.

35. The method of claim 32 wherein the applying the vacuum step further comprises reducing the pressure to an amount ranging from about 1 to about 0.02 mbar.

36. The method of claim 35 wherein the applying the vacuum step further comprises cooling the second mixture to a temperature ranging from about 210° to about 260° C.

37. The method of claim 36 wherein the cooling step comprises cooling the second mixture for a period of time ranging from about 100 minutes to about 195 minutes.

38. The method of claim 32 wherein the combining step comprises combining the 1,3-dihydroxybenzene, the first mixture of isophthalic acid and terephthalic acid, and the diphenyl carbonate at a molar ratio of from about 1.2:1.0:2.02 to about 1.5:1.0:2.25.

39. The method of claim 32 wherein the heating step further comprises adding the titanium tetrabutoxide catalyst in an amount ranging from about 20 ppm to about 500 ppm with respect to the final polymer.

40. The method of claim 32 wherein the heating step further comprises adding the sodium dihydrogen phosphate co-catalyst at a molar ratio of co-catalyst to catalyst ranging from about 2:1 to about 10:1.

41. The method of claim 32 further comprising subjecting the mixture to an argon purge of about 0.1 to about 10.0 l/min.

42. The method of claim 32 wherein the heating step produces a hydroxy-terminated isophthalate/terephthalate/resorcinol arylate oligomer having a Mw ranging from about 2000 to about 20,000.

43. The method of claim 32 wherein the heating step produces a hydroxy-terminated isophthalate/terephthalate/resorcinol arylate oligomer having a Mw of from about 1,000 to about 10,000.